

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (canceled).
2. (currently amended): A managing method for a re-order buffer in an out-of-order execution processor for predicting the flow of a program by branch prediction, determining a next executable instruction from an instruction string in the program and speculatively executing the instruction based on-the basis of a dependence relationship between the prediction and the instruction, in which said re-order buffer rewrites an execution result according to a program order and the end of the instruction is notified from each of a plurality of unetion function units containing a branching unit and a load unit to said re-order buffer by using a WRB number corresponding to an entry number of said re-order buffer, which comprises the steps of:

managing the a latest speculation state of a load instruction issued to said load unit by said load unit based on-the basis of a branch prediction success/failure signal output from said branching unit and suppressing notification to said re-order buffer by said load unit, as to a subsequent load instruction of a branch instruction for which the branching branch prediction has failed, based on-the basis of the WRB number of the subsequent load instruction even if the processing of the load instruction concerned issued to said load unit is finished, and

re-using an entry stored with the subsequent load instruction of the branching instruction for which the branching branch-prediction has failed, by the re-order buffer, to store a new instruction before the end notification based on the WRB number of the entry concerned is received,

wherein a control signal for discriminating non-speculative execution/speculative execution for every instruction under consideration, which corresponds to a branching level, is generated in an instruction fetch/decode unit, the branching level being set to zero when the an instruction-concerned under consideration is an instruction for non-speculative execution, and the branching level being set at a value of 1 or more which is determined by the number of branching instructions interposed between the an instruction for the non-speculative execution and the an instruction for the speculative execution when the an instruction-concerned under consideration is an instruction for speculative execution, the control signal thus generated is held in said re-order buffer and said load unit, and the branching level is decremented by 1 in said re-order buffer and said load unit when a branch-prediction failure signal is output from said branching unit, thereby managing the latest instruction speculation state.

3. (currently amended): The managing method as claimed in claim 2, wherein said load unit has plural entries, each of which holds a load instruction issued to said load unit together with the branching level and the WRB number thereof, and wherein the entries having a branching level of 1 or more are set to a cancel state when a branch-prediction failure signal is output from said branching unit, and with respect to load instructions held in the entries under the cancel state, a notification to the re-order buffer based on the basis of the WRB numbers of the load instructions

~~concerned issued to said load unit~~ is suppressed even if the processing of the load instructions ~~issued to said load unit~~ is finished.

4. (canceled).
5. (currently amended): An out-of-order execution processor for predicting the flow of a program by branch prediction, determining a next executable instruction from an instruction string in the program and speculatively executing the instruction ~~based on-the basis of~~ a dependence relationship between the prediction and the instruction, in which a re-order buffer in said processor rewrites an execution result according to a program order and the end of the instruction is notified from each of a plurality of function units containing a branching unit and a load unit to said re-order buffer by using a WRB number corresponding to an entry number of said re-order buffer, which comprises:

managing means for managing ~~the~~ a latest speculation state of a load instruction issued to said load unit ~~based on-the basis of~~ a branch prediction success/failure signal output from said branching unit and suppressing notification to said re-order buffer, as to a subsequent load instruction of a branch instruction for which the ~~branching~~ branch prediction has failed, ~~based on~~ ~~the basis of~~ the WRB number of the subsequent load instruction even if the processing of the load instruction ~~concerned issued to said load unit~~ is finished, said managing means being contained in said load unit, wherein the re-order buffer re-uses an entry stored with the subsequent load instruction of the branching instruction ~~for which the~~ ~~branching~~ branch prediction has failed, to store a new instruction before the end notification based on the WRB number of the entry concerned is received,

wherein a control signal for discriminating non-speculative execution/speculative execution for every instruction under consideration, which corresponds to a branching level, is generated in an instruction fetch/decode unit, the branching level being set to zero when ~~the an instruction-concerned under consideration~~ is an instruction for non-speculative execution, and the branching level being set at a value of 1 or more which is determined by the number of branching instructions interposed between ~~the an~~ instruction for the non-speculative execution and ~~the an~~ instruction for the speculative execution when ~~the an instruction-concerned under consideration~~ is an instruction for speculative execution, the control signal thus generated is held in said re-order buffer and said managing means, and the branching level is decremented by 1 in said re-order buffer and said managing means when a branch-prediction failure signal is output from said branching unit, thereby managing the latest instruction speculation state.

6. (currently amended): The processor as claimed in claim 5, wherein said managing means has plural entries, each of which holds a load instruction issued to said load unit together with the branching level and the WRB number thereof, and wherein the entries having a branching level of 1 or more are set to a cancel state when a branch-prediction failure signal is output from said branching unit, and with respect to load instructions held in the entries under the cancel state, a notification to the re-order buffer ~~based on the basis of~~ the WRB numbers of the load instructions ~~concerned issued to said load unit~~ is suppressed even if the processing of the load instructions issued to said load unit is finished.